THE MOTOR AGE

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STANLEY MOTOR CARRIAGE

DESCRIPTION OF THE MECHANICAL FEATURES OF AN ELEGANT CARRIAGE—SHOP METHODS EMPLOYED—THE MAKERS NOT AFRAID TO SHOW THEIR METHODS

As elegant in appearance as the finest electric carriage on the market, and even more elegant than any of those employing other forms of motive power, is the steam carriage of the Stanley Mfg. Co. shown on the front cover of this number of the Motor Age and also in the following text. Nor are the desirable qualities of this carriage confined to its appearance, for, in all the details of construction, not only great care, but scientific knowledge of the requirements of automobiles, has been exhibited.

The Stanley Mfg. Co. should not be confounded with the Locomobile Co., The Mobile Co., nor the Stanley brothers, all connected with the name Stanley and all employing steam as a motive power, utilizing what has popularly become known as the "Stanley type" of boiler and engine. Frank F. Stanley is the chief owner of the Stanley Mfg. Co., having offices at 117 Lincoln street, Boston, and a factory at Lawrence, Mass., where the McKay sewing machines for shoes are also made.

During a recent visit of a representative of the Motor Age to the factory, every facility was afforded for a careful inspec-

tion of the shop methods and the mechanical details of the carriages, of which a considerable number were seen in various stages of completion.

All parts of the carriages are made in the Lawrence factory except the bodies, wheels and tires.

Construction of Running Gear

No important detail has been overlooked in the construction of the running-gear, to which almost any style of body can be fitted. The entire engine mechanism and the body are carried independently on a substantially rectangular frame of steel tubing which is supported by three elliptical springs on another rectangular frame of steel tubing. From the rear of this latter rectangular frame perpendicular braced struts run down to the rear axle. The front wheels are set on the usual stub-axles, which are carried at the extremities of the triangular truss which shows plainly in the illustration on the front cover of the Motor Age. The upper corner of the triangular truss is hinged to the center of the rectangular frame, while braces from either of the other corners of the triangular truss lead up, and back, to the center of a transverse brace in the rectangular frame, where they are likewise hinged. This construction makes the running gear very rigid while allowing free play, up and down, for the front wheels. The entire running gear is thoroughly braced.

Steering Gear

The stub axles are set in brackets at such an angle from the perpendicular that a line projected through the center of the bearings would intercept the center of the tread of the wheels. This comparatively old, but still excellent, arrangement tends to keep the steering wheels in line with the rear wheels and keep the carriage moving straight forward, relieving the driver from the necessity of constantly keeping a firm grasp on the steering lever to correct the slight deviations from the straight path, caused by the wheels striking obstructions in the road. In the absence of the use of a quadrant or some one of the many controlling devices, this method of construction should always be adopted.

The boiler, engine, and water and gasoline tanks are all held firmly together. The gasoline tank sets within the water tank and the latter partially surrounds the engine and boiler. The whole mechanism is slidably carried on the spring-supported rectangular frame. From the small sprocket wheel on the driving shaft a chain leads to a large sprocket wheel, surrounding the differential gear on the rear axle. It will be remembered that the latter is attached to the rectangular frame that carries the springs, which, in turn, support the frame on which engine and body are carried.

Unique Yoke Connection

This necessitates some provision for maintaining a constant distance between the two sprocket wheels. This provision is found in the following: A yoke, rigidly attached either side of the differential gear, leads around the sprocket wheel and is connected by a ball-and-socket joint to a rod leading to the crank-shaft of the engine. On this rod is an adjustment to allow for wear and stretching of the chain. The yoke and rod, connected by the ball-and-socket joint, maintains the proper relations between the two sprocket wheels by causing the entire engine to slide backward and forward as the springs are compressed and released.

Boiler Construction

The boiler is an upright fire-tube boiler, fourteen inches in internal diameter, with 300 ½-inch tubes. The burner is fed with gasoline which passes from the tank through a tube over the burner itself and thence through three pipes to the burner, one feeding the pilot light, which burns constantly, unless turned off by hand, and the other two to the two sides of the burner, the flow of gas being regulated by the steam pressure through a diaphragm-governor of the usual type.

The Gasoline Burner

The burner proper consists of a cylindrical drum fourteen inches in diameter and two inches thick. From bottom to top of this cylindrical drum runs a large number of tubes, in pairs, one inside another, leaving a space between the tubes of a very small fraction of an inch. The gasoline vapor enters the outer tube through holes ⅝ of an inch below the sur-

face of the burner and thence, between the two tubes to the face of the burner. The admission of vapor so far below the face of the burner is for the purpose of guarding against "back firing." Air is admitted through the bottom of the inner tubes. The result is a very hot, blue flame.

Combustion Chamber

The combustion chamber is six inches high. The boiler feed-pipe enters the metal to enable the burner to be lighted in the wind.

Description of Engine

The engine is of the double acting, two-cylinder, upright type, 2¼-inch bore by four-inch stroke. The cylinders are of brass, with cast iron sleeves inside, and the piston rods are the same. The cylinders are jacketed with live steam. The admission and cut-off are fixed and controlled by slide valves.

STANLEY MOTOR CARRIAGE.

bottom of the combustion chamber and runs around its inner periphery in a helical coil to the boiler.

The burner is lighted by hand, a supply of liquid gasoline being admitted to a pan under the feed tubes and lighted to supply the necessary heat for vaporization. The mechanism is housed with sheet

The admission is governed by a spade handle in the steering lever and the reverse by a lever at the right hand of the driver. The engine can not, however, be reversed without first cutting off the steam as the reversing lever cuts off automatically before reversing. Speed and steering are, however, both governed by

the same lever, built after the Whitney type.

An Abandoned Feature

Some of the earlier vehicles were seen in which the reversing was also accomplished with the one lever, but this has been abandoned, owing to the great amount of mechanism contained in the lever, which was apt to rattle on rough roads.

The water, steam and gasoline gauges are set close to the boiler to prevent possibility of freezing in extremely cold weather. They are reflected in a mirror set on the dashboard, in easy view of the driver.

The exhaust passes through a muffler and is then carried through the boiler bonnet and reaches the air, together with the products of combustion, beneath the carriage.

Water and Gasoline Supply

Water is fed to the boiler automatically by means of an injector. The supply of water—about twenty-two gallons—is sufficient to run the carriage for twenty to thirty miles, according to the grades and condition of the road, while the eight gallons of gasoline is enough to last for sixty to eighty miles, according to conditions. The injector, with a supply of hose which is carried in the tool box of the vehicle, can be utilized to replenish the water supply. A hand pump is provided to give the initial supply of water. A foot pump is conveniently placed to supply pressure to the gasoline tank.

Braking Devices

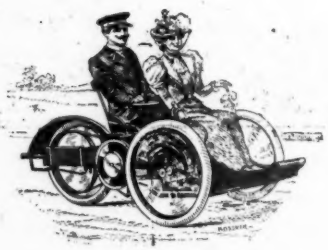
A foot lever governs two band brakes set at either side of the rear axle, to which the power is applied simultaneously. The use of two brakes relieves the differential gearing from any strain tending to strip the teeth of the gear wheels. The pulleys are of brass and the band is lined with wood and provided with an adjustment for taking up wear.

Great care has been taken to provide against loss of nuts and bolts by their jarring loose, all bolts being provided with set-nuts and nuts safeguarded with cotter pins.

Styles of Carriages

The most popular style of the carriage is that shown on the front cover. It is designed for two persons, but can be made to accommodate four by the use of a removable seat at the back and a let-down footboard, seating the passengers dos-a-dos. The carriages may be had with or without hood, or with a phaeton top, as shown in the illustration accompanying the text.

In finish and appearance general the carriage is all that could be desired by the most exacting. The price is $1,800.



MOTOR VEHICLE SHOWS

A MAMMOTH EXHIBITION PLANNED FOR PHILADELPHIA IN 1901—TO BE HELD IN THE BUILDING OF THE NATIONAL EXPORT EXPOSITION—TWO EXHIBITIONS TO BE HELD IN NEW YORK THE PRESENT YEAR

Philadelphia, Feb. 23.—An automobile exhibition in this city in 1901 is more than a probability—it is a surety—and if the unofficial assurances already received by the projectors are any criterion, the display will exceed anything of the kind ever seen in this country, if not in the world. The promoters of this monster exposition of the advances made in the construction of self-propelled vehicles will be fortunate in the possession of an exhibition building large enough to comfortably stow away four Madison Square Gardens, and so located as to be within easy reach of all sections of the city. The main building of the recent National Export Exposition, in the auditorium of which the Republican party will, in June next, nominate their candidates for president and vice-president of the United States, is admirably fitted for an exhibition of the broad character contemplated.

The Chief Promotor

At the head of the promoters is William P. Wilson, director of the Philadelphia Commercial Museum and manager of the National Export Exposition, in whose brain originated the idea for the Automobile Exhibition of 1901. Originally it had been Dr. Wilson's intention to open the show in September of the present year; but as it was found that the Paris Exposition would greatly interfere with the number and comprehensiveness of the foreign exhibits it was wisely concluded to postpone the show until 1901.

French Absorbed in Paris Fair

The French manufacturers, whose strides in the improvement of the automobile have been the subject of universal comment, are so absorbed in arranging for their World's Fair that they will not participate in any foreign display until that is well out of the way. They have, however, entered heartily into Philadelphia's project for 1901, and they—and the German, English and Belgian makers as well—have practically put themselves on record as positive exhibitors here.

Veteran Promoters

Dr. Wilson and the officers of the Commercial Museum and the Franklin Institute, who are veterans in the promotion of exhibitions on a large scale, are believers in the efficacy of an early start, and immediately after the close of the Republican national convention will inaugurate the contemplated improvements to the building and grounds. Among the necessary changes will be the construction of a magnificent mile track designed especially for speed contests between automobiles. This will be laid out on the broad stretch of ground lying between the exposition building and the Schuylkill River.

Foreigners Are Interested

Dr. Wilson has already succeeded in interesting the Automobile Club de France in the project, and many of the more prominent "chauffeurs" of that organization have promised to participate in these speed contests, for which prizes amounting in value to $20,000 will be hung up by the exposition people. This club alone will be represented by nearly 200 machines of various types, and will itself offer money prizes of equal value. Berlin's crack automobile club will also be represented, and it is highly probable that those of England and Belgium will likewise have representatives here during the continuance of the exposition.

It has been estimated that there are in this country at the present time nearly 200 manufacturers of electric, steam and gasoline propelled vehicles, and the Philadelphia Automobile Exhibition of 1901

will afford the public the first opportunity of inspecting the product of American makers in conjunction with the best examples of foreign ingenuity in the line of motor-carriage construction.

NEW YORK MAKERS SHOW

New York, Feb. 24.—New York is to have an automobile show at the Grand Central Palace, lasting a day more than two weeks from Saturday, November 10, to Saturday, November 24, both inclusive. The horse show will be held at Madison Square Garden from November 19 to November 24. It was very largely for this reason that the automobile show management selected this time, since it is believed that the very people in New York and coming to it as horse show visitors are the ones most interested in the motor vehicles.

Grand Central Palace was the scene of the last cycle show held under the auspices of the Cycle Board of Trade as well as of last spring's bicycle dealers' show. It has a floor space suitable for exhibition purposes nearly three times that of Madison Square Garden. The building is heavily trussed and previous experiences with carriage shows held there prove it to be available and strong enough for a motor vehicle exhibit.

The management of the proposed show is experienced, reliable and enterprising, being the same that conducted the successful electrical exhibitions at the palace the past three years.

It is announced that the space will be rented at far lower figures than usual and that many of the "extras" will be abolished.

The center space of 10,000 square feet beneath the dome will be left clear for purposes of exhibitions of motor vehicles in motion and charging stations will supply electric power free.

TO RIVAL HORSE SHOW

New York, Feb. 24.—Although no definite announcement of exact date and arrangements can yet be made, it is pretty sure that the Automobile Club of America will hold a motor vehicle show at Madison Square Garden the latter part of next October or early in November. Mr. Bostwick's committee, which engineered the club's participation in the race for the Bennett International Cup in France next June, has it in charge. This will add much to the probability of its being put through successfully.

It will be run on a far different plan from the trade show referred to elsewhere to be held late in November at the Grand Central Palace. It will be a show of moving life and be to automobiles what the horse show is to horses and carriages. The vehicles will be shown in the ring, with prizes for various classes, and also upon an encircling track. The latter may be turned into a race track, upon which motor cycles will be speeded and raced. In fact the whole show will follow the lines of last season's outdoor show of the Automobile Club of Great Britain, which appealed rather to the owner and rider than to the maker. The possibilities of such a show in the way of interest and novelty would seem to be great.

A RACE IN THE SNOW

A MERRY ACTRESS DRIVES HER ELECTRIC MOTOR VEHICLE AGAINST A HOTEL KEEPER'S RECORD HOLDING TROTTER, AND WINS AFTER A HARD STRUGGLE

The following amusing account of a race between Rose Coghlan, the well-known actress, in a Waverly automobile, and a hotel man behind his record-holding mare, is extracted from the Rochester Chronicle:

As the result of a wager made yesterday morning, Miss Rose Coghlan, leading lady of the "White Heather" company, and George W. Sweeney, proprietor of the Livingston hotel, gave a novel exhibition of a race between an automobile and a horse and sleigh. The automobile is the property of Miss Coghlan and is used in the play. W. J. Houck, agent for the automobile company, came with the machine to this city, where it was delivered to Miss Coghlan upon her arrival. In speaking of the merits of the machine to Mr. Sweeney, Mr. Houck grew quite enthusiastic, and stated that in a city it went as well in winter as in summer. Mr. Sweeney was rather skeptical as to this, and said it would be hard to manage. The former replied that a baby could handle it. Mr. Sweeney said if that were so, why not let Miss Coghlan prove the merits of the "auto" in a race to Brighton against a horse and sleigh.

Actress Relishes the Idea

Upon consulting Miss Coghlan she agreed to undertake the management of the machine if she would be allowed thirty minutes rehearsal with Mr. Houck previous to the start. This was satisfactory to all, and Miss Coghlan and Mr. Houck went immediately to the Baker theater, where the first lessons were given on the stage. She proved quite an adept, and in twenty minutes had mastered the principles of the machine with a proficiency which satisfied Mr. Houck of the "finish" of Mr. Sweeney's hopes for victory. The latter gave orders to have his mare Alice, who has a record of 2:16, to be hitched to a light cutter and brought to the front entrance of the Livingston at 3:30 o'clock.

The Race Begins

Promptly at the hour named both equipages were at the door, and all the participants were on the qui vive. Mr. and Mrs. Sweeney were in the sleigh, and on the front seat of the automobile were Miss Coghlan and W. J. Houck, while J. T. Sullivan, of the "White Heather" company, occupied the rear seat. At the word of command both vehicles started off, the horse at a sharp trot and the automobile following more slowly. By way of an adieu Mr. Sweeney called back, "So long. See you at Bussey's," to which pleasantry Miss Coghlan responded by calling out, "You'll have to. We'll be in front."

Rose a Skillful Driver

Under the careful guidance of Mr. Houck Miss Coghlan successfully piloted the machine past the Four Corners and up Main street east, Mr. Sweeney a long distance in the lead. Once on East avenue the intrepid woman increased the speed, and the race began in earnest. Not gaining fast enough to suit the "motor lady," she inquired of Mr. Houck whether more power couldn't be turned on. He replied that there was plenty. Whereupon she responded: "Well, let's have it all," and they "had it." According to Mr. Sullivan, "we simply flew and created a regular snow storm." Soon there was a perceptible decrease in the distance between the sleigh and the automobile. The intervening distance was gradually lessened till Culver road was reached, when it became a battle royal.

Neck and Neck

It was neck and neck, or, more properly speaking, neck and headlight. Mr. Sweeney coaxed and Miss Coghlan turned on the balance of the power, and automobile and sleigh skimmed along with a terrific

burst of speed. Gradually the machine began to draw ahead. Miss Coghlan could hardly be kept in her seat. She wanted to borrow some more power somewhere, and bemoaned the lack of a beast in front upon which to vent her excitement. Sleigh and "auto" hung close together with but small space between, and when the latter came to a stop in front of Bussey's hotel in Brighton Mr. Sweeney was about three-fourths of a block behind. The time of the race was just a little over seventeen minutes. Mr. Sweeney took his defeat in a laughing, good-natured way, and cheerfully sustained the loser's end of the bet by giving a supper to the participants at the Livingston last evening.

Auto Finishes Well

In spite of the fact that it was bad wheeling, the "auto" was no whit the worse for the trip, and appeared in the second act of "The White Heather" as scheduled. Barring the fact that both the occupants of the sleigh and of the automobile were like unto banks of snow, and presented a chilled appearance upon their return, they suffered no inconvenience.

Miss Coghlan and Mr. Houck are, of course, exceedingly well pleased with the showing made by the "auto." The former said last evening: "It is the most exhilarating experience I ever had. When I turned on the power the last time the machine simply jumped forward."

Her First Experience

"Have you ever handled one before?"

"Never so much as touched a steering bar till Mr. Houck showed me how to run it this morning. I had no idea it would work so easily."

"Were you nervous at the beginning of the race?"

"Only because I saw Mr. Sweeney getting so far ahead. I didn't know how fast the thing could go, and I was afraid we couldn't catch him. I wasn't afraid, if that's what you mean. I've ridden and driven some very spirited horses, but there isn't half the fun in it that there is in 'mobing.' How we did fly! The snow flew and I was simply a mass of white when we reached Brighton.

A Cold Ride

"Yes, it was cold. I haven't got warmed up yet, but all the same I wouldn't have missed it for a good deal. It was awfully funny to see the people on the streets. They stood and looked open-mouthed and some of the horses we passed wanted to join in the race. In my opinion bicycling can't touch riding in an automobile. I shall take the trap to my home in New Rochelle and use it to go to and from New York while I am appearing there in 'The Great Ruby.'

"Yes, indeed, it is going to be a great improvement over the Victoria and pair which we have heretofore used in our play. Sometimes you can't get a stylish turnout, and then it is so much bother getting the team in and out of the theater. The automobile is so much smaller that it can be handled without any trouble."

VARIABLE BELT TRANSMISSION

A NEW JERSEY MAN SECURES A PATENT FOR AN INGENIOUS BUT COMPLICATED DEVICE FOR A BELT TRANSMISSION DEVICE EMBODYING VARIABLE SPEED AND REVERSING GEAR

No. 643,627, to John C. Blevney, Newark, N. J.—While no sane person will subscribe to Blevney's assertion that his invention comprises a "simple and compact structure," still it is interesting to those who love mechanical novelties, for its ingenuity. Whether or not it will ever prove of any practical benefit, depends on the exactitude with which the details may be worked out. The patent office specifications follow, in part:

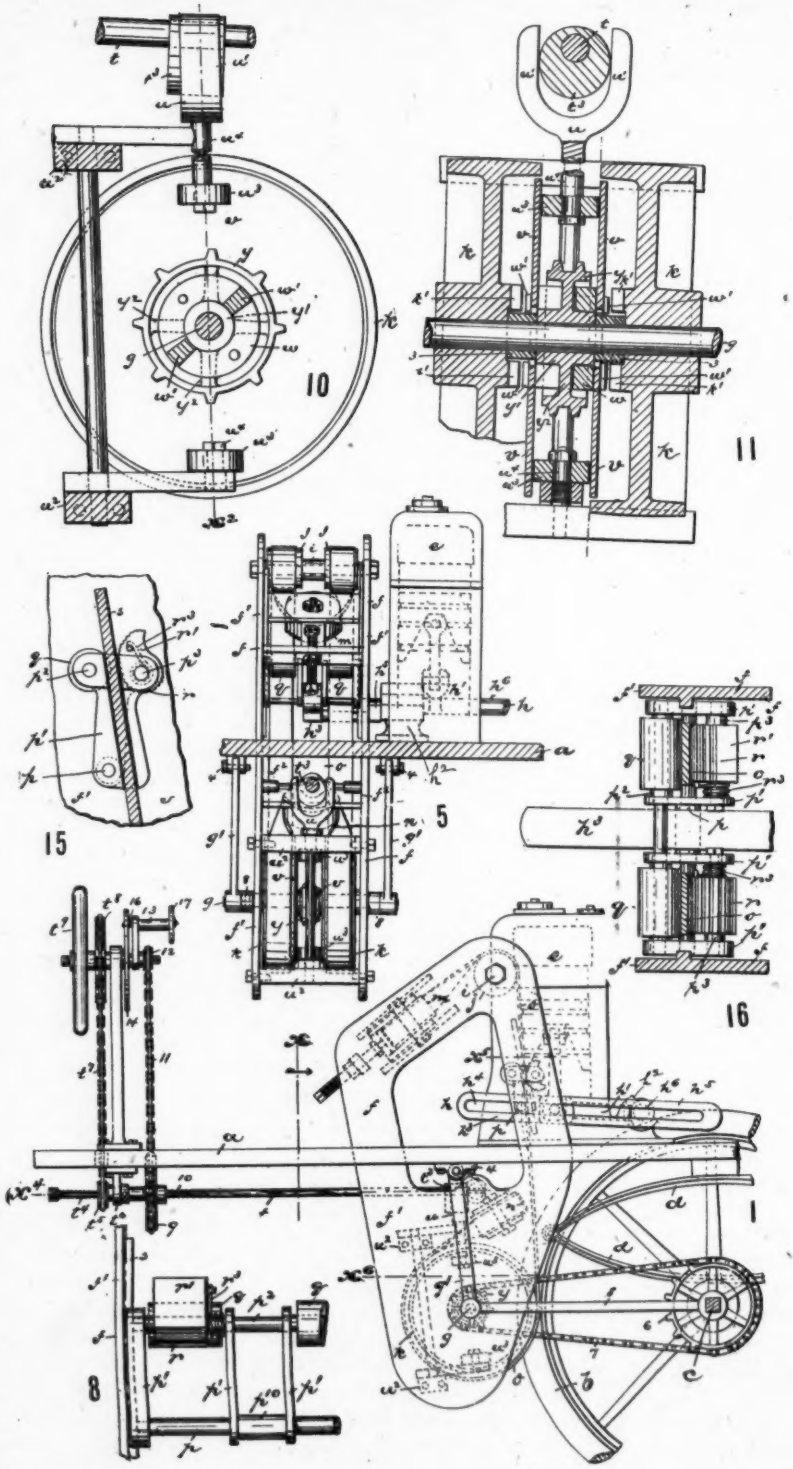
In the drawings, a, Figs. 1 and 5, indicates the body or frame of a vehicle or carriage, which may be of any suitable construction.

b is the vehicle wheel, c the axle of said wheel, and d the springs, interposed between the axle and body of the vehicle, the said body thus having a free vibration, either vertical or horizontal, as permitted by said springs.

e indicates the motor, which is seated and secured upon the body of the wagon or carriage, and is free to oscillate thereon in any direction with said body, and f indicates the swinging frame carrying the power-transmitting devices, said frame being also supported upon said body and free to move therewith in any direction that the springs d will permit and also movable independent of said body, as will be hereinafter fully described. Upon or in the said frame f are arranged certain pulleys and clutching mechanisms adapted to operate in connection with a flexible belt for transmitting power.

The motor e may be of any ordinary construction and may be adapted to utilize steam, explosive or combustible gas, electricity, liquid air, or any other source of motive power. In connection with the piston (not shown) of the said motor is a crank or lever shaft h, the arm h' of which extends into engagement with the said piston, and the pivotal part h6 of said shaft h is suitably arranged in boxes h2, bolted or fastened upon the body of the carriage. At one end of said lever or crank shaft h the same is provided with an arm h3 at right angles to the pivotal part, which arm h3 is preferably provided with a slot h4, as shown in Fig. 1. This arm h3 is preferably connected to the pivotal part of the shaft h by the U-shaped connection h5, which permits a certain gripping device to be brought closely in line with the axis of pivotal parts of the shaft-body h under conditions hereinafter more fully described. Said slotted arm h3 extends to a point between the side plates f' of the frame f, and preferably lies at a point midway between the said side plates f' f', where it has a rapid reciprocating action due to the oscillation of the shaft under the power of the motor-piston. The distance of the reciprocal action increases with the distance of the arm from the axial center of the said shaft, as will be apparent. Between the said side plates f' is arranged a series of pulleys. At the top of the frame, upon the shaft i, is arranged a pair of loose pulleys j j. At the lower end of the frame is arranged on the shaft g a pair of clutch-pulleys k k of larger diameter, and contiguous to the pulleys j j and k k are loose idle end pulleys m n.

o indicates an endless strap or belt, preferably of leather, which is turned over the idle end pulleys m and n and extends downward, one part parallel with another, over the pulleys j j and k k, the belt parts, where they lie side by side at points between said pulleys j j and k k, traveling in opposite directions, as will be understood. The oppositely moving parts of the said belt between said pulleys j j and k k lie a little apart one part from another —say two inches, more or less—and in the open space between is arranged the reciprocating slotted arm h3 for operating a double clutch and by means of said clutch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the endless belt. The said clutch comprises a frame or frames consisting of a shaft p, which may have an antifriction roller p10, Fig. 8, adapted to lie in the slot h4 of the oscillating arm h3. Said shaft p has arms or plates p' p' p' p' extending from said shaft or bar p, and at their upper end said arms or plates are provided with a shaft p2, upon which are arranged rollers to engage the back of the belt. Near to the shaft p2 and parallel therewith are shafts p3, supported by the arms p', on which shafts p3 are arranged eccentric dogs r r, each having a series of teeth or riffles, the eccentric projections r' pointing oppositely. The said rollers q and eccentric dogs r are in pairs, as shown in Fig. 16, a roller and a dog being arranged at opposite sides of the oscillating arm and engaging the opposite sides of the strap or belt and imparting motion thereto. The dogs being arranged oppositely, when reciprocated by the slotted arm alternately engage the oppositely-moving parts of the belt to effect the desired continuity of action of the latter in one direction. When the slotted oscillating arm h3 causes the frame and its dogs r to move therewith in one direction, one of the said dogs clutches one of the moving belt portions and imparts power and motion thereto. In the return movement of the slotted reciprocating arm the opposite dog r clutches the oppositely-moving belt portion and imparts motion thereto in the opposite direction, so that each movement of the reciprocating arm imparts movement to the belt, which helps in securing uniform or even movement of said belt.

The clutch-frame moving back and forth with the reciprocating arm h3 may be guided in its movements by ribs or slideways s, formed on the inner sides of the side plates f' of the frame. While I prefer to employ said guides, and thereby secure a more positive and regular movement of the clutching-frame, I may under some conditions dispense with said guides, the belt itself serving as a guide for the reciprocating clutching devices.

The centrifugal force due to the action of the oscillating arm h3 or the guides s causes the rollers q to press constantly against the back of the belt s, and the clutching-dogs being eccentrically disposed with reference to their axes act automatically to clutch the belts in one direction of movement and to release automatically from said belt when moving in the opposite direction.

The dogs r are caused to clutch the belt more quickly by means of springs, which tend to hold the cam or eccentric projections of the dogs in engagement with the belt, so that they will be quick to bite the belt when in proper movement to do so.

It may be noted that by the construction shown the gripping dogs r will not grip the belt o unless the speed of the dog equals the speed of the belt. Should the movement of the belt be greater than that of the reciprocating dog there will be no clutching action, as will be evident. It may be evident that there is a certain amount of independence of action between the movement of the belt and the movement of the reciprocating grip, and thus when the wagon is going at a high rate of speed and the belt also I can, when necessary, retard the propulsive action of the grip and its connections without interfering materially with the movement of the belt.

To vary the speed of the vehicle, I have pivoted the swinging frame f, as at g, upon links or pendulous connecting-rods g', and in connection with said frame I have provided adjusting mechanism adapted to be controlled by the motorman or driver of the vehicle. In this connection I employ a connecting-rod t, which is adapted to be either rotated axially to operate certain reversing-clutches or move longitudinally to turn the frame f on its pivots g or swing the same on pendulous rods g'. In securing the swinging movement the said rod t engages a cross-head, the said cross-head being provided with an eye to receive said connecting-rod and the said connecting-rod t being held in said eye by a head and a cam or eccentric collar t3. The opposite ends of the cross-bar t' are pivotally inserted in hollow lugs or boxes f, formed on the inner sides of the side plates f' eccentric to the pivot g. By this arrangement of parts when the connecting-rod t is moved longitudinally it will cause a movement of the frame f back or forth therewith, and this movement of the frame changes the relation of the belt-clutch to the slotted arm h3, so

that the said clutch is brought nearer to or farther from the center of oscillatory movement of said slotted arm h3, whereby the distance of reciprocation of the clutch with said arm will be increased or diminished and the speed of the belt and the vehicle driven by connections with said belt will be varied accordingly. Should the clutch-shaft p be brought into alignment with the axial portion h6 of the crank-shaft, the said oscillatory movement will be reduced to zero and the vehicle stopped, as will be understood. Thus by means of the said rod t and the means employed for operating the same longitudinally I may vary the speed of the vehicle from nothing up to the highest speed permitted by law or the desire of the driver within the capacity of the vehicle and driving mechanism.

To operate the connecting rod t longitudinally to swing the frame, I have provided the same at one end with screw-threads t4, Fig. 1, and on the threaded part I have arranged a threaded sprocket-wheel t5, arranged in suitable bearings t6 upon the vehicle and engaged by a chain t7, which extends to any point convenient for operation, where it preferably passes over a second sprocket-wheel t8, operated by a hand-wheel t9 or other suitable means in any desirable manner. The same connecting-rod t is employed for reversing the movement of the vehicle and stopping the same and carries at its end within the frame f the cam or eccentric t3, above referred to, adapted to operate a clutch-shifting lever u. The same lever u is provided with prongs u', between which the said cam or eccentric t3 is arranged, as shown in Fig. 11, and is fulcrumed upon suitable cross-bars u2 of the frame extending from side plate to side plate.

In line with the forked end of the lever is pivoted upon suitable fingers or projecting bearings u4 thereof rollers u3 u3, which are caused to oscillate with the forked end u'. When the eccentric t3 is turned by the shaft t, the said rollers u3 inserted between the clutch-plates v throw the said plates sidewise toward or from the pulleys k k.

To effect a clutching of one or the other of the belt-pulleys k k with the sprocket-wheel y for transmitting power to the axle of the vehicle, the plates v v are coupled or connected, so as to work laterally together under the action of the wheels u3, above referred to. The coupling or connecting means preferred comprises a collar w, arranged around the hub y' of the sprocket-wheel y, the said collar w being slotted, notched or recessed to receive the spokes y2 and permit a movement of said collar in the line of the axis of said collar in connection with the plates v. The collar at opposite ends is provided with clutching-teeth w', which extend through notches or openings in the plates v, through which said projections extend to enter into clutching relation to the teeth k' formed at the inner sides of the hubs of the pulleys k. The said plates v are also centrally perforated to receive the hub of the sprocket-wheel y and permit the lateral movement of the plates v. At the opposite sides of the sprocket-wheels y are or may be interposed collars or washers 3 between the hub of the sprocket-wheel y and the hub of the pulleys k to hold the sprocket-wheel and said pulleys in proper relative position. These, of course, may be dispensed with by increasing the length of the hubs and the said pulleys k k.

To hold the frame f suspended from the body a of the vehicle, I have provided links g', which extend upward from the shaft g to the brackets or boxes 4, the said links g' being suitably pivoted upon said brackets, so that the said frame f is permitted to swing upon the said body a of the vehicle, the swinging action being induced by the swinging or vibrating of the vehicle upon the springs d and the rod 8. Power is transmitted from the sprocket-wheel y to the axle c or a sprocket-wheel 6, arranged on said axle, by means of a chain belt 7, the said chain belt being held in operative relation to the sprocket-wheels y and 6 by means of the rod 8, which extends from said axle c to the shaft g.

To operate the clutches by means of which reverse movement is secured, I have provided means controlled by the operator for turning the shaft t in its bearings and the cam or eccentric t3 in the fork of the lever u. The means preferred are shown in Fig. 1, where 9 indicates a sprocket-wheel arranged on the said shaft t, preferably on the side of the

bearing t6 opposite that having the sprocket-wheel t5. Said sprocket-wheel 9 permits of the longitudinal movement of the shaft t therein, but is provided interiorly with a spline, adapted to enter a longitudinal groove in the shaft. The said sprocket-wheel 9 receives a chain belt 11, which receives its movement from a sprocket-wheel 12, arranged on bearings at a point convenient to be operated by the driver, said sprocket-wheel 12 being provided with a hand-crank 13, by means of which said sprocket-wheel may be turned on its shaft to effect the desired movement. Contiguous to said hand-crank is a dial 14, having stopholes 15 adapted to receive a sliding stop-pin 16 of the hand-crank, the said pin being arranged in a cylindrical extension of the crank and being provided with a handpiece 17.

The wheels k are preferably provided with heavy rims to serve as fly-wheels and to secure regular movement.

In operation the motorman or driver simply operates the handles and connections for moving the connecting-rod t either longitudinally or axially when the movements for changing the speed or direction of movement already described will be effected.

Blevney has secured no less than eighteen claims, none of them very broad. The first reads:

"The combination with a motor, a connecting-rod, and a crank having an arm, of a frame having an endless belt arranged therein over suitable pulleys journaled in said frame and a clutch arranged in connection with said arm, adapted to clutch the belt, and impart continuous movement thereto, substantially as set forth."

The sixth claim is as follows:

"In a horseless vehicle a swinging frame arranged on the body of said vehicle, having therein pulleys and a belt arranged over said pulleys, a clutch for imparting movement to the belt, means for operating the clutch and means for transmitting movement from the pulleys, and a clutch engaging one or another of said pulleys for changing the direction of movement of the last said transmitting means, substantially as set forth."

RACING IN FRANCE

Paris, Feb. 2.—The date of the first encounter in the international automobile race for the James Gordon Bennett cup is fixed for June 14. The itinerary, which has just been decided upon, lies between Paris and Dijon, the contestants passing by way of Fontainebleau, Montargis, and Nevers. The distance will be a little over 400 miles over roads whose perfect quality in point of smoothness may, of course, be described by simply saying they are French. There are hills, and some of them in nearing Dijon are formidable enough to "make any motor talk."

Paris "chauffeurs" have not by any means cooled off from their indignation at the arbitrary and partial manner in which the French team was selected a few weeks ago by the committee of the Automobile Club de France. Nevertheless, the fact remains apparent to perhaps a majority of the critics that the selection could not have been better. The three composing the team which will defend the colors of France are Charron, De Knyff and Girardot, each of whom has a record for absolute sang froid and daring in piloting an automobile creditable enough to dim all stories of western stage coach drivers.

"The International Motor Cup," in English, is the title bestowed by Mr. Bennett on his donation. It is known locally as "La Coupe Gordon-Bennett."

By ministerial decree there has been inaugurated for the period of the exposition a series of international contests and concourses, among which is found "automobilisme."

Nearly all of these fetes will be held at Vincennes, the site being known as the "Vincennes Annex." This annex was de-

cided upon as a measure for dividing the centers of attraction, and of favoring the eastern end of Paris. This part of Paris, though great and populous, is a little like "the west side" at Chicago, or Brooklyn at New York—a trifle sensitive on the subject of the attention it should always receive at the hands of the municipality—and hence Vincennes is slated for this big mark of patronage.

The plain fact is, the automobilists were told, "There is no room for you on the Champ de Mars," and thus it results that the autos, cycles and various other transportation appliances will be grouped about the Lake of Daumesnil in the Bois de Vincennes. This will give them what they most need—room for motion—for an automobile in particular can never do itself full justice in a state of rest on a stand.

In May there will be a convention of vehicles for touring. That is, ordinary road machines. These machines will weigh over 400 kilograms (880 pounds) and will be divided into four categories of two, four, six, and over six places for passengers, respectively. Their test will imply 150 kilometers (about ninety-five miles), with speed from twenty to thirty kilometers an hour.

In June comes a contest for the heavy omnibuses and merchandise wagons, capable of carrying 1,200 kilograms of load.

In July will be held the speed contests, and those will be for the flyers. The races will be from 300 to 400 kilometers each, the place of starting being Joinville-le-Pont.

Then in August the "voiturettes," or small types of automobiles, not weighing over 400 kilograms, have their inning.

In September provision is made for the "petit poids," or small wagons of utility, such as delivery carts, advertising tricycles, and their ilk, capable of carrying 100 kilograms maximum.

In October the "poid lourds," or heaviest of merchandise wagons or omnibuses, carrying as a minimum 1,250 kilograms (2,750 pounds).

There will be fetes and excursions without number, consisting of various evolutions of light carriages and games and contests of the gymkana order, to the utmost of French ingenuity, besides the series of programs of races. Elaborate flower fetes will furnish attractions during June, July, August and September, while in October, as a fitting finale to the entire season, there will be a grand parade of every known kind and style of auto-vehicle — automobiles, voitures de transport, de marchandises et de voyageurs, voitures de tourisme, voitures de course, fiacres, voiturettes, quadricycles, tricycles, motocycles, motocyclettes, etc.

That part of the program consecrated to speed contests is endowed with prizes of 8,000 francs for the winner, 6,000 francs for second, 5,000 francs for third, and smaller amounts for those less fortunate.

THE FRENCH RACING RULES

The following is the translation of the racing rules of the Automobile Club of France, adopted by the committee on runs, tours, contests and exhibitions of the Automobile Club of America:

PREAMBLE.

The ideas which have governed the drawing up of the present racing rules are the following:

1. The Automobile Club of France is the sole authority regulating races of automobile vehicles and motor cycles.

2. The general spirit of these rules is that the races are run and won by a combination of the machine and its riders, which must not be separated during the race.

I.—GENERAL RULES.

Article 1.—Every competitor entering for a race of motor vehicles or motor cycles is supposed to be acquainted with these rules, and undertakes to abide, without dispute,

by the results to which such rules may lead.

GENERAL PROVISIONS.

Art. 2.—All automobile races and record trials organized in France shall be controlled by the racing rules of the Automobile Club de France.

Art. 3.—All races which are not controlled by these rules are forbidden, and all competitors therein will be disqualified.

PUBLICATION OF PROGRAMME.

Art. 4.—The programmes of races—(1) Must be sent to the sporting committee of the Automobile Club de France; (2) and must be published in the press at least five days before the races, if they be on the track, or fifteen days if they be on the road.

Art. 5.—The programme shall contain—(1) The number of the prizes and the amounts for each race; (2) the distances; (3) the amount, if any, of entrance fee attached to each event; (4) the date and hour for closing of entries; (5) the amount of forfeit, if there be any; (6) the place at which entries are received; (7) complete and exact itinerary of road races. These itineraries shall not undergo any modifications, except from absolute necessity, in such cases notice shall be immediately given individually to each competitor.

Art. 6.—After publication of the programme no modification shall be made in it as regards prizes—the amount of which shall not be increased—or as regards the nature of the races originally announced. Mention shall be made on the first page of all race programmes that the meeting is held under the rules of the Automobile Club de France.

Art. 7.—A copy of the programme and rules shall be sent to each competitor on his entering for a road race.

CLASSIFICATION OF RACES.

Art. 8.—Races shall be "open" or "reserved." "Reserved" races shall be races confined to competitors fulfilling a definition stipulated by the promoters.

CATEGORIES.

Art. 9.—The categories officially recognized by the Automobile Club de France are as follows: (1) Vehicles (motor cycles and small carriages) weighing under 250 kilogs. (550 lbs.); (2) vehicles weighing more than 250 kilogs. and carrying at least two passengers side by side of an average of not less than 70 kilogs. (154 lbs.) each, it being understood that if the average weight of the passengers does not amount to 70 kilogs each, the deficiency may be made up with ballast. In track races and records, however, vehicles with two seats need only carry one passenger, but in road races two passengers are compulsory.

In addition, the promoters may subdivide the two foregoing categories into as many classes as they please.

Art. 10.—The sporting committee shall be the sole judge of the classification of all motor vehicles, as well as of questions which may arise therefrom.

ENTRANCE FEE AND FORFEITS.

Art. 11.—The amount of the entrance fee shall be fixed by the promoters, who will decide whether it is repayable or not to the competitors who have started.

Art. 12.—The forfeit is not a matter of right; it must be specified on the programme, as also its amount.

Art. 13.—Entrance fees which are repayable and forfeits, if they are not claimed within a month, shall become the property of the promoters.

ENTRIES.

Art. 14.—Entries shall be made as follows: (1) By letter; (2) by telegram, confirmed by letter of same date.

Art. 15.—Any entry which is not accompanied by the fee or which is sent in too late will be annulled ipso facto.

Art. 16.—Any competitor wilfully sending in a false statement may be prevented from starting, and will be liable to a fine.

RACING NAMES.

Art. 17.—Any competitor may use a racing name subject to approval by the sporting committee.

Art. 18.—The racing name becomes permanent and cannot be changed without the permission of the sporting committee, to whom a written request must be sent, accompanied by a fee of 20 francs.

STEWARDS OF THE COURSE.

Art. 19.—In every race upon the road or on the track the promoters shall choose three stewards, whose appointment must be approved of by the sporting committee, and whose names should be communicated at the same time as the programme.

Art. 20.—The stewards are entrusted with the carrying out of the programme, and with seeing that the rules are strictly observed, and are also to settle any protest that may arise out of the race.

Art. 21.—The stewards can either prevent a competitor from starting, or start him after the others, if his inexperience or the construction of his car would seem to present a danger to other competitors.

Art. 22.—The stewards have a right—(1) To prevent a competitor from starting; (2) to publicly reprimand a competitor; (3) to impose fines up to a maximum of 200 francs ($40); (4) to disqualify a competitor for a maximum period of a month.

In these two latter cases the competitor has a right to appeal to the sporting committee.

Art. 23.—Should the stewards deem that a heavier fine ought to be imposed, they can apply to the sporting committee, which has full power to inflict any penalty after taking evidence from those interested.

Art. 24.—The starter is appointed by the stewards, and he alone judges the validity of a start.

Art. 25.—As a general rule the start is given while the vehicles are at a standstill, and they must start by their own means, but in certain cases a flying start will be allowed with the sanction of the stewards.

Art. 26.—The start shall take place in the order of entry, unless by special arrangement.

Art. 27.—In races upon the track the start shall be given to all the competitors at the same time, and this can also be done on the road; or the vehicles may be sent off at regular intervals between each competitor.

JUDGE AT WINNING POST.

Art. 28.—At the winning post there shall be one judge, and his decisions shall be final. If, however, there is a large number of competitors the judge is entitled to assistance, but the judge must be chosen by the stewards.

Art. 29.—The winning of a race is judged from the front of the front wheel for motor cycles and motor carriages alike.

Art. 30.—Should two or more competitors finish level the judge declares a dead-heat, and the two prizes shall be equally divided between the competitors finishing level.

Art. 31.—In distance races the competitor must cover the whole course in order to be entitled to a prize.

Art. 32.—In time races the competitors shall be placed according to the number of kilometers covered.

Art. 33.—When a single competitor starts a limit of time may be fixed by the stewards within which the course must be covered.

Art. 34.—Should a single competitor start in a race he shall have the right to the first prize.

OBSERVERS AT CORNERS.

Art. 35.—Observers chosen by the stewards shall be placed at the corners of the course to see that one competitor does not interfere wilfully or otherwise with another by wrongfully getting in front of him, or shutting him in, or by any other manoeuvre which would be calculated to wrongfully affect the result of the race.

OBSERVERS IN ROAD RACES.

Art. 36.—In road races a certain number of observers shall be appointed and placed where it may be necessary to stop the competitors, or compel them to drive at a stipulated speed, and the observers shall see that these instructions are strictly adhered to by the competitors.

TRACK.

Art. 37.—The measurement of the track shall be taken at 0.30 metre from the inside ropes. On all tracks the winning post must be indicated by a clearly indicated line.

Art. 38.—For the establishment of records on the track a certificate of measurement, with an annexed plan prepared by a qualified surveyor, shall be furnished.

GENERAL REGULATIONS RELATING TO RACES.

Art. 39.—Any competitor who in a race crosses in front of another, shuts in or obstructs another by any means so that the latter is prevented from advancing, may be stopped in the race or penalized by fine or disqualification, so long as the collision was not rendered unavoidable by a third competitor or the competitor who was obstructed was not himself in fault, but the fact that the collision was involuntary, or that it did not affect the result of the race, shall in no case be admitted as a valid excuse.

Art. 40.—No competitor shall be allowed to cross the course of another until he is at least two lengths of his machine ahead of such other competitor.

Art. 41.—No sign or advertisement shall be displayed on any vehicle while racing.

Art. 42.—No vehicle shall be pushed or assisted by any one other than its authorized occupants under pain of disqualification.

Art. 43.—Competitors shall be responsible for all civil and criminal penalties whatsoever.

SPECIAL REGULATIONS FOR TRACK RACING.

Art. 44.—A competitor wishing to pass another must do so on the outside, and so as to leave the competitor passed the following space from the rope, viz., for motor cycles 1.30 metres (4 feet), and for motor cars 3 metres (10 feet).

Art. 45.—A race containing too many entries may be run in heats, semi-final and final.

Art. 46.—The racing stewards shall arrange the heats, semi-final and final, and their decision shall be without appeal.

Art. 47.—No accident shall admit of a competitor running again, either in another heat or in the final.

Art. 48.—Any competitor leaving the track to get off his machine must start again from the point where he left the track.

SPECIAL REGULATIONS FOR ROAD RACING.

Art. 49.—In road races the approach of a competing vehicle must be notified by a horn, trumpet, or some similar instrument.

Art. 50.—Vehicles which have to travel by night must display a white and green light in front and a red light behind.

Art. 51.—In road racing, competitors must conform to the traffic regulations of the police.

Art. 52.—Competitors must make themselves acquainted with the route, and no allowance will be made for mistakes they may make. Moreover, if any competitor takes a shorter or easier route than the one prescribed, he will be disqualified. The stewards shall be sole judges of the comparative distance or ease of the routes followed.

PROTESTS.

Art. 53.—The right of protest lays with the competitor, but the stewards can always interfere officially in case of necessity.

Art. 54.—Any competitor lodging a protest must always substantiate his grounds of

protest, and the competitor protested against has the right of being heard in opposition to the protest.

Art. 55.—No protest will be considered unless it is put into writing. Protests must be considered by the stewards on the spot, and a decision shall be come to immediately, whenever this is possible.

Art. 56.—Protests shall be lodged at the times and in manner following: Protests as to classification of competitors and of machines, as to validity of entry and payment of entrance fees—before the race and verbally. Protests as to unfair running, errors of route, or any other irregularities on the route—within 24 hours after the race, and in writing. Protests as to the fraudulent starting of a competitor in a race for which he was not qualified—eight days after the race, and in writing. For protests in races on the road—eight days after the finish of the race.

PENALTIES.

Art. 57.—Penalties imposed on competitors in and organizers of races are recoverable immediately on their being notified to the parties concerned and on their publication in the journals officially notified by the sporting committee.

DISQUALIFICATION.

Art. 58.—If a competitor is disqualified in a race he loses all right to a prize.

OFFICIAL AND PUBLIC REPRIMAND.

Art. 59.—A public and official reprimand is pronounced by the stewards or by the sporting committee of the Automobile Club de France, and involves the insertion in a public journal of an official notification by the sporting committee.

FINES.

Art. 60.—The moneys received in fines shall be paid into the funds of the sporting committee, to be distributed or devoted to sporting competitions.

II.—REGULATIONS AS TO RECORDS.
TIMEKEEPERS.

Art. 1.—The sporting committee shall appoint the official timekeepers and shall prepare a list of them every year.

Art. 2.—Timekeepers to be eligible for appointment must (1) possess a reliable chronometer stop-watch, certified as first-class by the observatories of Besancon, Geneva, or Kew; (2) furnish the name of the maker of their chronometer stop-watch.

Art. 3.—The sporting committee may, when they see fit, require the timekeepers to renew the certificates as to their chronometers being first class. Certificates must be renewed every three years.

Art. 4.—The appointment of timekeepers is revocable at any time. Before appointment they must—(1) Submit to an examination permitting of the chronometrical test (a) of 10 tests of 500 metres (500 yards) and under; (b) of 10 tests of from 500 metres (yards) to 2,000 metres (yards); (c) of two tests of 20 kiloms. (15 miles) at least, or a test of 50 kiloms. (38 miles), the stop-watch showing the time of each lap and the time of the total distance.

In the above tests the candidate for appointment as timekeeper shall write down on the forms, of which a model is deposited at the offices of the Automobile Club de France, the times recorded by him. At the same time a certified official timekeeper shall make similar entries, but independently of the candidate. The candidate shall remit these forms, duly filled up, to the certified timekeeper in a sealed envelope. At the end of the tests the certified official timekeeper shall forward these forms to the sporting committee of the Automobile Club de France, together with the results of his own checking, certifying that the examination has been properly conducted, and that there has been no collusion, comparison or correction of results.

Art. 5.—The sporting committee shall decide on the appointment after examining and comparing the written results. A candidate who has been rejected may re-enter for election after a month.

Art. 6.—Timekeepers must sign the forms recording the times taken by them. Any timekeeper signing a record not made by himself will be ipso facto disqualified. He will also be disqualified by the simple decision of the sporting committee that his records have not been confirmed.

Art. 7.—The sporting committee takes cognizance of records on the track and road records. Each of these two categories comprises records of distance and of time, as well as the records for both categories defined by article 9 of the racing regulations.

Art. 8.—The distances officially recognized for record racing are: On the track, 500 metres (547 yards); from 1 to 100 kiloms., per kilom. (1,094 yards); and for distances beyond 100 kiloms., per 50 kiloms. On the road: 500 metres; from 1 to 10 kiloms., by kiloms.; from 10 to 50 kiloms., by 10 kiloms.; from 100 kiloms., by 100 kiloms. The official distances in English miles: Distances of miles, 50 miles and 100 miles will be recognized.

Art. 9.—All races for records must be made from standstill, and vehicles must be started only with their own power.

Art. 10.—Races for records of 500 metres (547 yards) and of from 1 to 10 kiloms., inclusive, may be made by flying start.

Art. 11.—The time records of the Automobile Club de France are records by the hour without limit.

Art. 12.—The time records from town to town are also by the hour without limit (homologous).

Art. 13.—No record will be recognized as official unless it has been established over distances rigorously tested, and unless the time has been checked by several official timekeepers recognized by the Automobile Club de France.

TRACK RECORDS.

Art. 14.—Starts for track records shall take place from a tape.

Art. 15.—Attacks on the record shall be timed according to the laps around the track and by the hour up to 100 kiloms., by kilom., and by hour up to 200 kiloms., and by the 5 kiloms., and by the hour from 200 kiloms. upwards.

Whilst timing records timekeepers are expressly advised to take the times of the English distances at the half-mile, mile, and all the military distances, especially the 10, 20, 30, 40, 50, and 100 miles, and above the last-named distance by the 100 miles.

ROAD RECORDS.

Art. 16.—Road records straight ahead are recognized from 1 to 50 kiloms., above that distance they are taken by the 50 kiloms. Road records permit of embracing the outward and return journey for all distances.

TIMEKEEPERS' FEES.

Art. 17.—Timekeepers are forbidden to accept any remuneration over and above the tariff fixed below, viz.: For a day, or part of a day, occupied in racing or in getting to and from a race, 30 francs ($6.00).

Art. 18.—The traveling expenses of timekeepers are arranged by mutual consent.

Art. 19.—Every timekeeper must, at his own expense and on his own responsibility, procure such assistance he may require in working out his calculations, or for any other outside act or operation required, not strictly coming within the province of a timekeeper.

Art. 20.—Timekeepers may be temporarily suspended or have their appointment revoked for any act affecting their private or professional honor. Provided that this step cannot be taken unless by order of the sporting committee, after the accused timekeeper has been heard.

Art. 21.—No timekeeper shall be required to act as such for more than six hours at a stretch.

OPERATION OF THE REGULATIONS.

Special Article.—The present regulations shall come into force and be binding on all promoters of automobile races as from January 1, 1900.

ADDENDA TO RACING RULES.

The sporting committee of the Automobile Club de France believe they will be doing a useful work in bringing to the notice of organizers of road races, by means of its instructions and its opinions as regards road racing. The sporting committee being a branch of the society for the encouragement and development of the automobile industry appreciate that the aim of holding trials and competitions under uniform conditions is to demonstrate the excellence or the faults of the various competing vehicles. The region of true sport has nothing to lose but everything to gain by looking thus upon matters which must tend to bind together all organizers of races, and to so arrange their programmes as to secure as much uniformity as possible. With regard to races of one stage only there should be no difficulties. If the starting signal is given to all vehicles at one time the task of the judge at the finish will be greatly facilitated. If the start and the finish are timed by chronometer the times can be taken with exactitude. The committee recommend that only their official timekeepers should be employed in all cases.

According to the regulations as to records the only homologous times are those certified by the official timekeepers. For races in several stages the question is more difficult. As a matter of fact, it is certain that the obligatory stoppage and storing of vehicles in an enclosure in the town at which a stage ends add to the complication and also somewhat to the expense, but there is no other means of obtaining a reliable test. Moreover, if there is no enclosure a vehicle arriving at the end of a stage in a damaged state and virtually unfit to continue its journey on the morrow, could be repaired, and, so to say, thoroughly renewed during the night by a body of workmen. In this way a vehicle constantly under repair might start every morning in as good condition as one never needing repair. Such a result would be unfair from a sporting view, whilst it would be injurious from the point of view of the progress of automobilism.

Another point of some nicety is the following: It is clear that even the best vehicle in the world, after doing a stage of 200, 300, or even 400 kiloms., at high speeds, requires, before proceeding again, to have its principal parts tested, adjusted, cleaned, and lubricated, to have its reservoirs replenished, etc. It is necessary, therefore, to give competitors, both on arrival in the enclosure and before leaving, a certain time for looking to their vehicles. Therefore, to comply with the spirit of what has been said above, the competitors during this time ought only to give their vehicles the above necessary and reasonable attentions, but not to do any repairs.

The question is, where do these necessary and reasonable attentions end and repairs begin?—a very thorny question. Whilst it may be said that any fair-minded and competent persons can avoid being deceived, it cannot be denied that it is not practicable to fix a definite limit. The only practical way to steer clear of complicated regulations which it would be impossible to enforce strictly, and which would lead to endless disputes, whilst at the same time preventing trickery, is to allow a very short space of time for attending to the vehicle, both on arrival and before departure. For example, an hour on arrival and 15 minutes or half an hour before departure.

To effect this object it is understood that if a vehicle does not put in an appearance before the starter at its specified time, or is not in a fit state to start away when the signal is given, then its time is reckoned from the moment the starting signal is given, whether or not it is ready to start.

The arrangement and supervision of the enclosure should, therefore, have the most careful attention of the organizers and stewards.

As in racing by several stages the arrivals must necessarily be timed by chronometer, it seems natural to make the starts also by time. The first day the vehicles can leave according to the order in which they were entered, but the following day they will leave in the order in which they arrived the night before.

In road racing, whether in one or more stages, competitors are allowed every opportunity of effecting repairs on the road, but the time occupied in so doing is counted as their running time. However, in conformity with the ideas just expressed, the sporting committee strongly recommend the sealing of all the essential parts of the vehicles, such as wheels, motors, frames, etc. Naturally competitors must not be allowed to replace parts which have been sealed. Steps should be taken on arrival, and also at certain stages, to see that these sealed parts are in place, and any vehicle which is found to have any of these parts wanting will be disqualified from the race. The employment of lead seals which are liable to be pulled out on the way is not recommended in the case in question.

These precautions are particularly recommended with motor cycles, the parts of which it is so easy to change in the course of a race.

Organizers of road races must not forget that they must obtain the authorization of the prefects and the consent of the mayors of the departments and communes traversed. Often they will be obliged to bind competitors down to certain speeds over certain districts of the journey (in towns, dangerous portions of route, etc.). In this case they must take care to enforce on the competitors the exact observance of the specified speeds over these portions of the route.

The sporting committee earnestly enjoin on organizers to indicate fully and plainly to competitors the routes to be followed by means of notices, signboards, etc., to call attention to dangerous places, and to the places where speed must be slackened.

It is by the adoption of such measures intelligently carried out, and in accord with the local authorities, that accidents of all kinds may be avoided. Still it cannot be denied that these involve considerable work in long stages. These recommendations must not be taken as implying any modification of the regulations which provide that competitors take all risks and responsibility, whether arising from their errors or otherwise, and whether civil or penal, which may happen to them. The organizers, after having conscientiously done their best, must decline to accept any responsibility for errors of route which competitors may make, and leave entirely on their shoulders all responsibility, whether civil or penal, which they may incur.

Such are the broad lines which the sporting committee think should be adopted in the organization of road races to ensure order.

MINOR NEWS AND COMMENT

WORKINGS OF LIQUID AIR

The workings of liquid air are well illustrated by the Minneapolis Journal. That enterprising paper gives a lengthy eulogy on the virtues and values, possible and impossible, of the newly discovered fluid, lauds Professor Tripler to the skies and finally ends with the following:

"A limited block of the company's stock has been placed on the Minneapolis market through William L. Shepard, 508-9 New York Life building. See ad. on market page, this issue."

It remains to be seen whether or not the people of Minneapolis will allow any of this valuable stock to be offered in "small blocks" in other cities.

PHILADELPHIA CAB COMPANY

Philadelphia, Feb. 23.—At the annual meeting of the Pennsylvania Electric Vehicle Co., held in this city last Wednesday, the president's report showed that when the company instituted its cab service here last June eight vehicles were sufficient to meet all requirements, but that the automobiles had grown in favor at such a rapid rate that at present twenty-seven are kept going constantly night and day to meet the public's demands for motor cab service. The expense of maintaining the station at the start was approximately as large as at present, while the receipts were, of course, materially smaller. During the seven months that

the company has been operating its vehicles in this city the receipts have practically covered expenses, the excess of receipts over expenditures during the last three months having about equaled the loss incurred during the preceding four months. At this rate it is thought that the next year's business will show a handsome profit. The policy of the company has been from the start a very conservative one, excessive caution being displayed in the enlargement of the outfit. but the showing up to date has bred such confidence in the management that it purposes instituting its service in all the principal cities of Pennsylvania during the coming year.

TO COMPETE WITH CAMELS

James Dedrick, a Californian, who has just returned from China, is here arranging for the purchase of a number of ten-ton steel wagons and traction engines to draw them, says a dispatch from Bucyrus, O. He will establish a service across the desert in China, and will enter active competition for the carrying trade, which is now done by camels. He says the camels can carry only about 600 pounds each and make only twenty miles a day, while his wagons will carry ten tons each and can make sixty miles.

He has been over the ground thoroughly, and he expects to have fifty engines and 3,000 wagons actively engaged within a year. The first consignment will be shipped March 15.

PARRY FACTORY SITE

The Anderson parties who are talking of engaging in the automobile business in Indianapolis, says the News of the former city, may be interested to know that the Parry Mfg. Co. has definitely decided to erect its new carriage and automobile factory on a tract of seventy-six acres of land recently purchased by the company just south of the crossing of the Cincinnati division of the Big Four railroad and the Belt. D. M. Parry, president of the company, said that the construction of buildings will begin in the latter part of July or the first of August, and that the necessities of the business will require buildings which, if only one story high and placed end to end, would be six miles long. However, he says, most of them will be two stories high and 100 feet wide.

KAINTZ MOTOR CARRIAGE

The Kainz gasoline motor "voiturette," of which the accompanying illustration gives an excellent view, is constructed by Joseph Kainz, of Vienna, Austria. The entire motor mechanism is contained within the metal hood shown at the front of the voiturette—a favorite construction among continental makers.

The motor is of the single-cylinder, ver-

Kaintz Motor Carriage.

tical type, and runs at the rate of 1,200 revolutions a minute. It develops 3½ horse power and is entirely air cooled, the exact method being kept secret pending the issuance of patents covering the device. The weight of the motor mechanism is stated to be only eighty-eight pounds.

The power is transmitted by means of cog-wheels to the rear axle, giving three speeds—five, 11¼ and 18¾ miles an hour. The changes of speed and reverse are obtained by the use of one clutch in connection with the toothed wheels. The clutch

is on the engine shaft, so that, when running idle, the engine is perfectly free. The gearing is all enclosed in a gear case.

The complete vehicle weighs 550 pounds. A further description will be given in the Motor Age at a later date.

The inventor of the vehicle is shown driving in the illustration.

OILING PUBLIC ROADS

The report is that there are now about 100 miles of road in the southern part of California which have been treated to the oiling process, and the opinion is expressed that, so pronounced in every instance has been the success of the application, the latter will be employed to the extent of a thousand miles in the near future in that region. Experiments show that where the road has an even, hard foundation, smooth and clear of ruts, with about two inches of dust on the surface, upon such a road the oil is a complete success, presenting a surface as polished, clean and clear as an asphalt street; where the soil is clayey, though the surface is rutty, this treatment will maintain the hard character to the ground, allay all dust and prevent further disintegration by resisting the formation of mud, the oily and impervious ground holding the water in the ruts until it dries out, the earth beneath being preserved from saturation with it; on a road of deep, blue sand, the oil is reported as showing little benefit. One hundred barrels of oil per mile, spread over an area of 18 feet in width, will put a road in good condition along the extent of the oiled surface, and give an excellent roadway, adequate for ordinary traffic. The oil, according to this report, is put on in three applications, the first at the rate of sixty barrels per mile and the two subsequent treatments at a rate of twenty barrels per mile each. The oil has to be hot when discharged, and poured upon a hot surface, so that the work of oil sprinkling is confined to the heat of the day.

THE SWORD IN A NEW ROLE

It is plain now that the street car people are to have a modern Damocles sword suspended above their heads for the next few years, says the Decatur (Ill.) Record. This will assume the shape of an automobile, something that has been developing for a dozen years, the running qualities of which, according to report, are exceeded only by its ability to break down.

Whenever the street car people show a disposition not to be good someone will be sure to run out an automobile, and there is no telling how long this instrument of torture will be kept on the program. It made its appearance early in the existence of the new franchise, but it was threatened even earlier than it came. When there was talk about the amount of paving the street car company should bind itself to do, someone suggested the company could be brought to reasonable terms by having an automobile dangled before it.

MOTOCYCLE RECORDS

The first batch of motocycle records accepted by the Automobile Club of Great Britain has just been announced. They are as follows:

TRICYCLE—STANDING START.

1 kilom.	Osmond	1:02 2-5	Oct. 9,	1899
2 kilom.	Beconnais	1:42 1-5	Jan. 24,	1900
10 kilom.	Beconnais	8:41	Oct. 9,	1899
20 kilom.	Beconnais	17:19 4-5	Oct. 9,	1899
50 kilom.	Beconnais	43:48 2-5	Oct. 9,	1899
100 kilom.	Beconnais	1:34:26	Nov. 11,	1899
1 hour	Beconnais	67.901 kilometers.		

TRICYCLE—FLYING START.

1 kilom.	Beconnais	42 4-5.		

BICYCLES—STANDING START.

1 kilom.	Frasier	1:08 4-5	Nov. 16,	1899
2 kilom.	Frasier	2:02 3-5	Nov. 16,	1899
10 kilom.	Frasier	8:40	Jan. 1,	1900
20 kilom.	Frasier	17:01	Jan. 1,	1900

WANTS HEAVY MOTORS

Firms who are willing to figure on furnishing steam motor wagons for the purpose of hauling loads aggregating fifty tons per day over a distance of seventy-five miles will do well to communicate with the editor of the Motor Age. The wagons must be fitted with speed change gears, must be provided with wide tires and must be capable of hauling two trailers each. The road over which the wagons are to be run is nearly level for the greater part of the seventy-five miles. The freight to be carried is heavy and com-

pact. Grades do not exceed four per cent. The firm desiring these wagons wishes them to give as speedy service as is consistent with the carrying of the load. They should be capable of performing the journey in one day. Water can be obtained at almost any point on the road.

MOTOR CYCLES IN WAR

A dispatch from Cape Town stating that the railroad at Sterkstroom is being patrolled by a motor cycle having a speed of thirty miles an hour, has caused much comment among those who are interested in the practical possibilities of cycles for military use. The fact that motor cycles built by firms of little experience here have developed on a circular track a speed considerably in excess of that mentioned left no room for doubt on the score of the speed serviceability of this type of machine in just such cases as that mentioned.

It has been pointed out by commentators that even in case of there being no good road running parallel with the railway, that a two-wheeler making only a single track would usually find a bed between the sets of ties and rails hard and smooth enough for a high rate of speed. Nearly every railroad bed affords such a cycle path, while the width of it is prohibitive of a four-wheeled motor vehicle and hardly sufficient for a galloping horse.

The question of the utility of bicycles at the front is one that has been the subject of a continuous discussion in Englond ever since the war in the Transvaal began. The cycling press of London has been "pegging away" in advocacy of a common-sense employment of cyclists in the field, and a few of the more conservative dailies have been paying special attention to the matter.

It has recently been decided to send a scientific corps to Africa the latter part of this month. This corps is the electrical engineers of the Royal Engineers, commanded by Major R. E. Crompton, who is prominent in the cycling field, and is known here because of his strenuous advocacy of the use of long cranks. The corps numbers 330 men, of whom fifty have volunteered for service. They will receive a practical test of laying field telegraph and telephone lines. It is said by Major Crompton that three cyclists can carry three sets of instruments and enough wire to lay one mile of field telegraph in ten minutes over ground practicable for riding, and in twenty-five minutes if the cycles have to be pushed by hand. Thus six cyclists can string two miles of wire, and so on.

ONE VIEW OF IT

"Will the automobile oust the horse? If we examine an old map of this country," says Charles Barnard in St. Nicholas for March, "we may trace a black line beginning at Cumberland, in Maryland, and extending across the mountains to the Monongahela River above Pittsburg. This line indicated the great national road built by the United States as a highway from the East to the then far West in the Ohio Valley. Over this great road thousands of horses traveled in endless processions, dragging great covered wagons; swift stage coaches ran, day and night, carrying passengers and mails; This road, with its enormous traffic, was regarded as one of the wonders of the new world. Washington considered it a most important public work, and believed that all the country needed in the future was more horses and more national roads. To-day this long and costly road is almost forgotten. The great wagon trains and swift stages long ago disappeared.

"When, about sixty years ago, the railroads came, many people thought horses would no longer be needed. This was soon seen to be a mistake. It was found that it took more horses to carry the freight and passengers to the railroad stations than were used before the railroads were built. When, about twelve years ago, the trolley cars appeared, then many people said: 'This time the horses will certainly retire, for there will be nothing for them to do.' Has it been true? And now, within two years, people have said the horses will surely disappear, for here are carriages without horses. Do you believe that will be true?"

Right or wrong in his deductions, Mr.

Barnard does not take into consideration the fact that the auto is the first competitor of the horse that does not require a special track and can go anywhere that a horse can drag a vehicle.

NOTES OF INTEREST

A Sioux City, Ia., man has applied to the city council of that city for a franchise to operate an automobile line for a period of fifty years.

The Stroudsburg (Pa.) Automobile Co. will run a line of automobile 'busses from that town to points up the Delaware Valley the coming summer.

Ruben C. Foster has been appointed receiver for the Crouch Automobile & Transportation Co. of Baltimore, and has been placed under $10,000 bonds.

General von Gossler, the German minister of war, recently stated before the Reichstag that motor-vehicles had proven a valuable adjunct in army transports.

The Oyler Mfg. Co. has been incorporated under the laws of Minnesota for $50,000 to manufacture automobiles, bicycles and vehicles generally at Minneapolis.

The Woods Electric Vehicle Co. of Chicago have, according to the Milwaukee Evening Wisconsin, leased the big barns of F. P. White, on Astor street, between Knapp and Ogden, for the purpose of establishing a motor-vehicle livery.

The Erie Wheel & Motor Cycle Co. of Anderson, Ind., is energetically pushing the construction of its motor-vehicles, having recently contracted for the gasoline motors that are to be used. Complete vehicles are expected to be ready by May 1.

It is said that fifty-two automobile wagongs have been specially built in Paris for inland service in Africa, says the Western Electrician. They will be used in the Congo Free State to transport freight and passengers from the present terminus of a railroad at Badunbe to the upper and lower Niger. As the railroad construction advances the automobile route will be shortened, and after the completion of the railroad the wagons will be transferred to the other side of the Niger, which will be connected by automobile routes with important places in the rich western Soudan. It is said that the new transport service will be much cheaper than human porterage.

The American company which is endeavoring to introduce its team automobiles in Paris is having an up-hill time of it, as the city statutes prohibit the use of steam boilers on the streets without special permits. Such permit has not, up to the present time, been obtained for the American vehicles.

Probably no larger or busier automobile factory is now running in the world than that of the Columbia & Electric Vehicle Co. at Hartford, which occupies the old Pope tube mill, which has been greatly enlarged, as well as the Hartford cycle factory. A thousand men are at work and orders have been received for no less than 4,000 electric cabs alone.

The city council of Champaign, Ill., has granted a twenty-year franchise to the Twin City Automobile Transfer Co. to operate a 'bus line between that city and Urbana—the other twin. Cars twenty-six feet long will be utilized by the company for service between the two cities and the grounds of the University of Illinois. Smaller vehicles for use over longer distances.

In New York, recently, the driver of an automobile was called on for assistance by a rotund and puffing policeman who was hopelessly in the rear in his pursuit of a would-be murderer. Climbing into the auto the policeman pointed out the fugitive and ordered the auto driver to give chase. The latter, nothing loth, opened the throttle and soon the criminal was overtaken, and now resides in the Tombs.

One of the latest schemes of which the auto has become a part is that of a proprietor of bowling alleys. In Chicago bowling is the reigning craze, and there are bowling alleys galore. Naturally competition is keen. The owner of the alleys in question, finding his location too remote to appeal to the club element, has added free transportation by means of auto-cabs as an inducement to pat-

ronage. The novelty of the attraction has resulted in a large increase in patronage.

The Winslow Motor Carriage Co., a Philadelphia concern, has been incorporated under the Delaware laws for $300,000. The object, as stated in the charter, is the manufacture of motors, motor-vehicles and motor vehicle machinery.

The Woods Electric Vehicle Co. is threatened with a serious strike. The Chicago machinists' union is making a general demand for higher wages and shorter hours and the Woods factory is only one of many involved in the trouble.

The Van Wagoner & Williams Hardware Co. of Cleveland are large manufacturers of drop forgings and have devoted a considerable amount of attention lately to the production of forgings for automobile makers. They are already supplying several of the foremost firms in this line of business.

Mr. Pennington perpetrated a questionable ad. the other day in New York by having one of the Rapid Vehicle Co.'s automobiles driven at such a speed on Fifth avenue as to bring about the arrest of the driver. The little scheme not only lacked in originality, but, by a violation of a reasonable city ordinance, added to a prejurice it is the aim of all sensible automobilers to avoid.

The Apex Mfg. Co., of Rochester, has been experimenting on a rotary motor for the past year and state that they have at last succeeded in producing an engine that runs perfectly. A few minor changes will be made before the engine is exhibited to the public and it will probably be late in the season before the company's automobiles, fitted with the new motor, will be ready for the market.

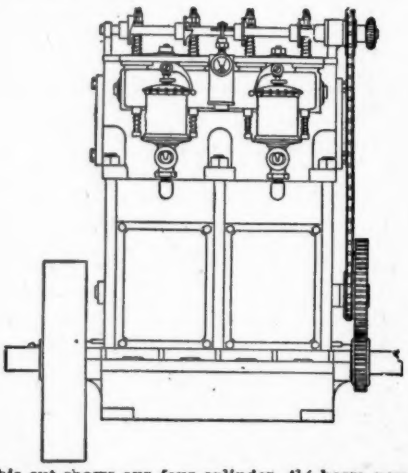
A Massachusetts town largely engaged in carriage manufacture was recently set by the ears by requests to its factories for bids for 50,000 wagon bodies for automobiles. It is believed that the requests came from the enormously capitalized motor vehicle company which recently wrote to many bicycle factories asking for bids for motor building, and as to which the Horseless Age, Motor Age and the British trade papers have had occasion to refer to of late with some suspicion of incredulity.

Dudley Marks, the motor cyclist, calls attention to the fact that the hour record of Charles Jarrott, the Englishman, is but 34 miles 978 yards, against the 41 miles made by Albert Champion, the Frenchman, while Beconnais, the real record-holder, has placed the top notch mark at 42¼ miles for the hour.

Following the leadership and suggestion of the trade journals, the dailies are now beginning to take heed of the possibilities of a very general public interest being taken in motor cycles. It is notable that all recognize the fact that the bicycle dealers are the natural and proper ones to handle this new trade.

USERS OF MOTOR-VEHICLES

Are invited to contribute letters giving experiences of interest, trips, tours, etc. Questions concerning any feature of motor-vehicles will be carefully answered. Address, The Editor, The Motor Age, 324 Dearborn St., Chicago.



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